

REMARKS

The Attorney for the Applicant wishes to thank the Examiner for the telephonic interview conducted on April 5, 2006. During the interview, the following was agreed upon: (i) the Attorney for the Applicant acknowledged that the previous amendment filed February 8, 2006 was non-compliant because claim 7 did not include a status identifier; (ii) the Applicant agreed to resubmit the amendment with the proper status identifier for claim 7; and (iii) the Examiner agreed to withdraw the current rejection of the claims based on Ciccarelli (US Patent 6,075,237, Prabhu (US Patent 6,873,024) and Miwa (US Publication 2005/0030505) references. The Attorney for the Applicant wishes to personally thank the Examiner for her cooperation.

For the sake of completeness of the record, the Applicants remarks submitted in the non-compliant amendment are provided below.

In the Office Action dated January 17, 2006, the Examiner rejected claim 1 as anticipated by Ciccarelli (US Patent 6,075,237) and rejected claims 1-26 under 35 USC 103 as unpatentable over Prabhu (US Patent 6,873,024) and Miwa (US Publication 2005/0030505). The applicants have not amended the claims. Claims 1-26 remain at issue.

The Art Rejection

The Applicants have reviewed the Examiner's "Response to Arguments". With all due respect, the Applicants believe the Examiner comments with regard to Ciccarelli are completely without merit.

In paragraph A, the examiner states:

Applicants argue that Ciccarelli does not disclose applying and patterning a photosensitive layer on the lid to create the transparent regions and the support regions.

Ciccarelli, in col 2, lines 7-19 discloses that the preferably epoxy (epoxy is inherently photosensitive) is coated on the cover glass (transparent, optically transparent, lid) and patterned to form a transparent and support regions.

A review of Ciccarelli, however, indicates that the Examiner has made a number of completely false statements in formulating the rejection. As noted in the previous amendment, Ciccarelli is directed to a package for a semiconductor imaging chip. The package 10 includes, as best illustrated in Figures 3, 4a and 4b, an image sensor 12 positioned on a conductive pad 13 within a cavity 18 in the package. A glass plate 20 is placed on the package. The glass plate 20 is silk screened to define an opaque light shield region 22 and an aperture 28. With regard to the fabrication of the glass plate 20, Ciccarelli teaches the following in Column 2, lines 12-18:

Preferably, an **opaque epoxy** is silk-screened onto the cover glass 20 to **form light shield 22**. The silk screen has aperture 28 within the pattern used to form light shield 22. The epoxy (**or any opaque material** such as paint, glue, or a thin film deposition such as a metal or an oxide) is used to fashion light shield 22 is patterned to the appropriate size, which is predetermined for a particular sensor, to form an integral light shield 22 on cover glass 20. (emphasis added in bold).

Ciccarelli therefore explicitly teaches that the cover glass 20 is silk screened with an opaque epoxy to form the light shield 22 having an aperture 28. The Examiner's statement that "*epoxy is inherently photosensitive*" is therefore completely false. In fact, Ciccarelli uses the opaque material to create the light shield portion 22 of the glass 20. Opaque, by definition, means "*Impenetrable by light; neither transparent nor translucent.*" See the definition of opaque as printed off the Internet web site www.dictionary.com, copy attached as Exhibit A.

Furthermore, the purpose of the opaque epoxy used by Ciccarelli is to create non-transparent light shield portions 22 on the cover glass. There is absolutely no teaching or suggestion whatsoever in the reference concerning using the light shield portions 22 to create support regions. On the contrary, Ciccarelli explicitly teaches that the cover glass 20 is mounted onto the vertical sidewalls of the package. The Examiner's statements that the glass cover 20 of Ciccarelli is patterned to create support regions is false.

Claim 1 therefore has a number of features that are not taught in Ciccarelli. These features include:

(i) a lid that is fabricated having both a transparent region and support regions. In Ciccarelli, the glass cover 20 does not have any support regions.

Instead, the glass 20 is flat and is designed to be sealed to the vertical support walls of the package 10 of Ciccarelli,

(ii) applying and patterning a photosensitive layer (i.e., optically transparent) on the lid to create the transparent region and the support regions. Ciccarelli on the other hand applies an "opaque" material such as paint, glue, or a thin film metal or oxide onto the lid 20,

(iii) mounting the lid directly onto the die. In contrast with Ciccarelli, the image sensor 12 is mounted within a recess of the package and the glass cover 20 is mounted onto the vertical walls of the package.

For the above reasons, claim 1 is not anticipated by Ciccarelli.

The Examiner also rejected the claims based on the combination of Prabhu and Mira. The applicants disagree. The examiner has failed to demonstrate a prima facie case of obviousness.

Prabhu is directed to the wafer level packaging of imaging die. In Prabhu, a wafer shaped transparent template 20 as illustrated in Figure 2 is created. The template 20 includes a plurality of die cover regions 22 held together by tie bars 24. Recess regions 26 are defined as the space between the regions 22 and the tie bars 24. See column 3, lines 32-44. Once the template is made, it is aligned and laminated onto a semiconductor wafer. See Figure 3. In one embodiment, a bead of resin is deposited around the periphery of the imaging circuitry 16 on the die to form a spacing structure 30. See column 3, lines 64-67 and column 4, lines 1-5. In an alternative embodiment, a spacing structure 32 is formed by dispensing a layer of clear epoxy over the imaging circuitry 16 on the die. See column 4, lines 17-21. With either embodiment, the spacing structure is formed on the surface of the die. In a third embodiment, Prabhu teaches that either the bead of resin or the layer of clear epoxy forming the spacing structure 30 could be applied onto the template 20 and then laminated onto the wafer. See column 4, lines 37-39.

Mira discloses an exposure machine for exposing and patterning semiconductor wafers and substrates.

In formulating the rejection, the examiner states that it would be obvious to pattern the template of Prabhu using the Mira exposure machine to form the transparent and support regions of the lid of the present invention. The applicants strongly disagree. There is absolutely no teaching in either reference, either alone or in combination, to form a lid patterned using semiconductor fabrication techniques to form integral support regions. Prabhu actually teaches away from the invention of fabricating a transparent lid with integral support regions. On the contrary, Prabhu specifically teaches that the spacing structures 30 or 32 are formed by dispensing a material onto the dice of the wafer or the template itself. The material is dispensed where it is needed on the die or template; i.e., either (i) as a bead around imaging circuitry of the die or corresponding area on the template or (ii) applying a transparent epoxy layer over imaging portion of the die or the corresponding area on the template. Since the material is dispense where it is needed, there is no need for subsequent patterning of the material. One skilled in the art would therefore have no reason whatsoever to look at the Mira reference. The proposed combination is therefore improper.

Mira describes a machine used to expose and pattern a substrate using well known photolithographic techniques. This process typically involves coating a wafer with a resist like material, applying a mask over the resist layer, and then etching the wafer to remove the resist in the non-masked areas. Again, since the Prabhu reference teaches the application of the spacer material 30 or 32 only where it is needed, there is absolutely no reason one skilled in the art would go through the aforementioned patterning steps as taught by Mira to arrive at the present invention as claimed.

Lastly, both Prabhu and Mira disclose absolutely nothing about patterning a lid having a transparent region and support regions. Accordingly, even if it were proper to combine the references, the proposed combination still would not teach the present invention.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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